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RESEARCH DEVELOPMENTS

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**A new era in
early years
learning**

**Addressing
educational
disadvantage**

**The science of
learning**

Indigenous
primary school
experiences

Australian Council for Educational Research

ACER



Professor Geoff Masters
Chief Executive Officer

Building a learning society

In order to build a society in which every learner experiences success and has the opportunity to achieve their potential, governments and education systems require good information about the quality and equity of educational provision. Dependable data are required to evaluate the impact of programs and initiatives designed to improve quality and equity and to monitor progress in closing educational achievement gaps for traditionally disadvantaged groups of students, including students with disabilities, Aboriginal and Torres Strait Islander students, students with limited English language proficiency, students from low socioeconomic backgrounds, and students living in remote and very remote parts of Australia.

In this edition of *Research Developments*, Adrian Beavis reports on an ACER analysis of school funding arrangements for disadvantaged students. This analysis was undertaken at the request of the Review of Funding for Schooling Panel. In another article in this issue, Kate Reid summarises the findings of a seven-year study of Indigenous primary students' literacy and numeracy achievements. The research described in these two articles illustrates some of the ways in which ACER is working to ensure that the learning needs of particular student groups are being identified, understood and addressed.

In a third article, I describe the emergence of an exciting new multidisciplinary research field known as the 'science of learning'. This field is bringing together and integrating research findings from neuroscience, psychology, complex systems, educational research and classroom teaching practice to build a deeper understanding of fundamental learning processes. Earlier this year ACER formed a partnership with the Queensland Brain Institute to establish Australia's first Science of Learning Centre. This Centre will work to develop better understandings of learning processes, which in turn will inform effective teaching practices.

Finally, Bridie Raban discusses the impact of new legislation in early childhood education and care that comes into effect in 2012, some of which ACER has been involved in evaluating. These imminent changes to the early childhood sector – and the increased focus on learning that they bring – will be an important step towards improving school readiness and creating better educational opportunities and outcomes for all young children.

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Indigenous primary school experiences

Kate Reid discusses the findings of a seven-year study of the literacy and numeracy achievement of Indigenous students as they progress through primary school.

Most children develop literacy and numeracy skills throughout primary schooling, allowing them to transition successfully to secondary school and to fully access post-school opportunities. For some children, however, the development of literacy and numeracy is more problematic. Indigenous students are over-represented in this group. The reasons for Indigenous educational disadvantage are, however, complex.

Motivated by a desire to develop a data-rich picture of Indigenous primary school experiences, in 2000 ACER commenced the *Longitudinal Literacy and Numeracy Study for Indigenous Students* (ILLANS).¹ At the time the study was conceived, longitudinal studies on the school achievement of Indigenous students were comparatively rare. ILLANS tracked the development of English literacy and numeracy skills in a group of Indigenous students from school entry through the early years of schooling and beyond. It also collected information on student background and attitudes from a variety of informants, in order to establish a more complete

picture of primary school experiences of Indigenous students.

Phase 1 of ILLANS collected data from Indigenous students who commenced their primary education in the year 2000 at 13 schools across Australia. These schools had been nominated by education systems as examples of good practice in education for Indigenous students. The first three years of the study were reported in the monograph *Supporting English Literacy and Numeracy Learning for Indigenous Students in the Early Years* (Frigo et al., 2003).

Phase 2 of ILLANS followed students through Years 3–6 of primary school, from 2003 to 2006. For Phase 2 of ILLANS, 11 of the original 13 schools from Phase 1 agreed to participate and 14 additional schools across Australia were also recruited. Again, all schools that participated were nominated because they had recognised initiatives and supports for Indigenous students at their school. Across the final four years of the study, 297 Indigenous students and 685 non-Indigenous students from 25 schools completed at least one literacy or numeracy assessment.



Dr Kate Reid is a Research Fellow in ACER's Teaching, Learning and Transitions research program.

Seventy-two Indigenous students completed all four literacy assessments and 70 Indigenous students completed all four numeracy assessments.

The findings of Phase 2 of ILLANS were first presented at the 2011 ACER Research Conference *Indigenous Education: Pathways to Success* in Darwin and have now been published as ACER Research Monograph 65, *Literacy and Numeracy Learning: Lessons from the Longitudinal Literacy and Numeracy Study for Indigenous Students* (Purdie et al. 2011).

Underlying the approach of the ILLANS study was recognition that the development of literacy and numeracy skills is fostered by a range of factors – both those that are intrinsic to the child and those that are characteristic of the child's broader environment, including their school and family. Thus, in addition to standard assessments of literacy and numeracy conducted annually from

Years 3 – 6, a range of other qualitative and quantitative data was collected. Teachers rated participating students' achievement and attentiveness. In the final year of the study, students completed questionnaires that focused on their attitudes towards reading, their perception of their school's climate, and their evaluation of their own personal achievement in learning. Background variables to the study provided by principals, teachers and Australian Indigenous Education Officers included data on student absenteeism, the main language spoken by students at home, parental occupation and the percentage of Indigenous students attending the school.

ILLANS revealed that on average, in the first year of primary school Indigenous and non-Indigenous students in this study achieve similarly in literacy and numeracy. By the start of Year 3, there was a gap in average achievement between Indigenous students and



their non-Indigenous peers. From Year 3 on, Indigenous students improve at a similar rate to their non-Indigenous peers. However, the gap in average achievement between Indigenous and non-Indigenous students that is evident at the start of Year 3 remains until the end of primary school.

There was, however, enormous variability in literacy and numeracy achievement within as well as between groups. Although the average achievement for Indigenous students overall is lower compared with non-Indigenous students, many Indigenous students achieve at a high level in literacy and numeracy relative to their peers. In some schools, Indigenous students were performing as well as or better than non-Indigenous students.

The student questionnaire revealed that Indigenous students and non-Indigenous students expressed similar opinions about their engagement

with and attitudes towards reading. Indigenous students were, however, more likely to agree that they read only if they had to, and to agree that they read only to get the information they need. Non-Indigenous students were also more likely than Indigenous students to agree that they often read in bed. While a higher proportion of Indigenous students reported they did not spend any time each day reading, for those children who did read, the amount of time spent reading was very similar for Indigenous and non-Indigenous students. Indigenous students tended to have fewer books in the home than non-Indigenous students, but they borrowed books from the library as often as non-Indigenous students.

Indigenous and non-Indigenous students provided similar ratings of their schools' climate and of themselves as learners. Most students evaluated their personal achievement

highly, expressing enjoyment in attending school and positive attitudes toward learning. Almost all students rated the quality of the learning environment and their relationships with their teachers positively. School climate was identified as an important predictor of student achievement in both literacy and numeracy, with students who provided favourable ratings of their school's climate recording higher achievement.

Of the student-level factors, attentiveness, language spoken at home, absenteeism and parental occupation were associated with both literacy and numeracy achievement. Students rated as more attentive by their teachers tended to record higher literacy and numeracy achievement, while students who spoke Standard Australian English at home also tended to achieve more highly in literacy than students who spoke other languages at home. Higher levels of student



absenteeism were associated with lower achievement in literacy and numeracy, and students whose parents were in professional occupations tended to achieve more highly in literacy and numeracy.

Case study visits to five schools participating in Phase 2 of ILLANS, each with unique school and community profiles, enabled exploration of the between-school variability in literacy and numeracy achievement. Each school experienced challenges in attempting to engage both Indigenous and non-Indigenous parents in the life of the school. Notions of a culturally inclusive curriculum varied widely and practices to support the integration of different cultural perspectives were quite different between schools. The case study visits identified a clear need among staff at these schools for ongoing, relevant professional development to empower them

to work with Indigenous students more effectively.

Improving educational outcomes for Australian Indigenous students remains at the forefront of government agendas. The six *Closing the Gap* targets set explicit deadlines for making substantial improvement in education and employment outcomes for Indigenous people, including halving the gap in achievement for Indigenous students in reading, writing and numeracy by 2018. Research initiatives such as ILLANS provide evidence that affirms the importance of identifying those factors that are critical to supporting the literacy and numeracy achievement of Indigenous students. Developing stronger links between schools and Indigenous communities, promoting attendance among Indigenous students, quality teaching, ensuring a good start to schooling, and developing a school culture in which Indigenous students feel included and

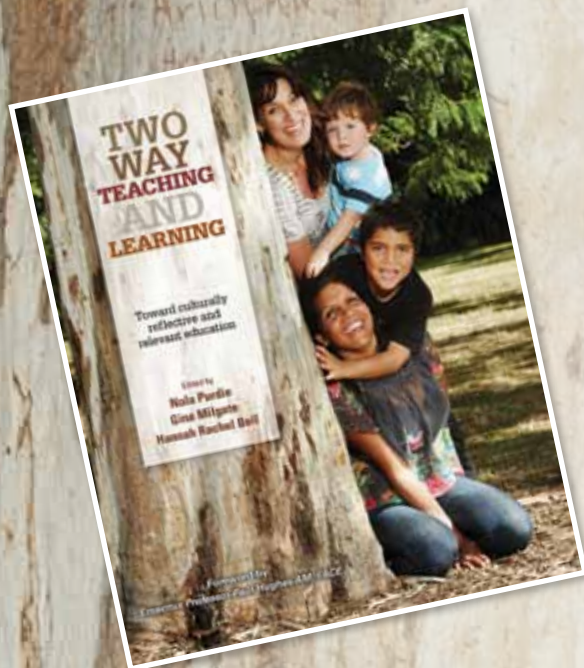
supported to learn are key aspects of closing the gap in educational achievement for Indigenous students.

ACER Research Monograph 65, *Literacy and Numeracy Learning: Lessons from the Longitudinal Literacy and Numeracy Study for Indigenous Students* by Nola Purdie, Kate Reid, Tracey Frigo, Alison Stone and Elizabeth Kleinhenz, is available as a free download from <research.acer.edu.au/acer_monographs/>. Print copies can be purchased from ACER Press. Visit <shop.acer.edu.au> or contact customer service on **1800 338 402** or via email on sales@acer.edu.au ■

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1. In this article and in the monograph on which it is based, the term 'Indigenous' refers to people who are of Aboriginal and/or Torres Strait Islander descent. We acknowledge the distinctiveness of each student's cultural group. Overall, our intent has been to use language that accords respect and dignity to Australia's first people.



Two way teaching and learning key to educational equity



While reforms such as the National Curriculum seek to close the gap in Indigenous disadvantage, a new book by 24 contributing academics, teachers and community leaders suggests that Aboriginal and Torres Strait Islander students' educational outcomes will only be improved when teaching and learning become part of an equal and genuine cultural exchange.

In *Two Way Teaching and Learning: Towards culturally reflective and relevant education*, co-editors Hannah Rachel Bell, ACER Principal Research Fellow Dr Nola Purdie and ACER Indigenous Liaison Officer Gina Milgate highlight the overriding need for Australian people and educational systems to better engage with communities and elders in order to address the underlying issues that face Indigenous people from socially and culturally diverse backgrounds.

Two Way Teaching and Learning was officially launched at the ACER annual Research Conference in Darwin in August. Research Conference 2011, on the theme *Indigenous Education: Pathways to success*, was a fitting

place to launch the book, which focuses on policy issues, strategies to improve outcomes for Indigenous students, and ways in which people of different cultures can learn from each other.

The book was launched by respected Indigenous education expert Ms Isabelle Adams. Ms Adams has had a long association with ACER and its work, having joined the ACER Council in 1986, and first initiated the project to produce a volume of research essays by Aboriginal authors back in 1999.

Speaking at the launch, Ms Adams said the book will be useful for educators and researchers and will be a powerful tool to change the thinking of education systems in this area.

Two Way Teaching and Learning is available for purchase from the ACER Online Shop at shop.acer.edu.au or by contacting customer service on 1800 338 402 or via email on sales@acer.edu.au



Hannah Rachel Bell and Isabelle Adams at the *Two Way Teaching and Learning* book launch

A young boy with dark hair, wearing a green hoodie with 'MSK BIKER CREW' and 'M+S' printed on it, is focused on playing with colorful building blocks. He is holding a green block in his hands. In the foreground, there is a red tray filled with various colored blocks (red, yellow, blue, green, white). To the right, another child's hand is visible, holding a red block. The background is slightly blurred, showing a white shelf with some items on it.

A new era in early years learning



Professor Bridie Raban is a Senior Research Fellow in ACER's Teaching, Learning and Transitions research program.

Bridie Raban explains the impact of changes to Australian early childhood education legislation that come into effect in 2012, for which ACER has conducted an evaluation.

Learning begins long before children go to school. From birth, the adults in a child's life play an important role in enriching the child's environment and encouraging development. Adults working in early childhood education and care are usually second only to family members in the amount of one-on-one time spent with children under the age of five. As a result of a number of national and international policy developments, for the first time in Australia we are about to see a nationally coordinated early childhood sector.

In 1990 the United Nations Convention on the Rights of the Child stimulated discussion and focus around the world on young children, their health, education and welfare generally. This discussion was taken further in Australia by the then Ministerial Council for Education, Employment, Training and Youth Affairs and embedded in the 2008 Melbourne Declaration on

Educational Goals for Young Australians, in which the Australian governments committed to developing and improving early childhood education. Further to this Declaration, in 2009 the Council of Australian Governments signed the National Partnership Agreement on the National Quality Agenda for Early Childhood Education and Care, and since this time early childhood education and care has gained considerable attention after unanimous acceptance of the significance of the early years of life.

The early years before children begin formal schooling are now recognised as important in encouraging and promoting children's learning across all the domains of development; social, emotional, physical as well as cognitive. Research has provided irrefutable evidence to support this re-evaluation of the purpose and direction of all services for young children and their families. For instance,

to characterise the work of early childhood staff as 'looking after' babies, toddlers and young children while their parents go to work, is no longer an acceptable description of 21st century professionalism around education and care during these significant early years of life.

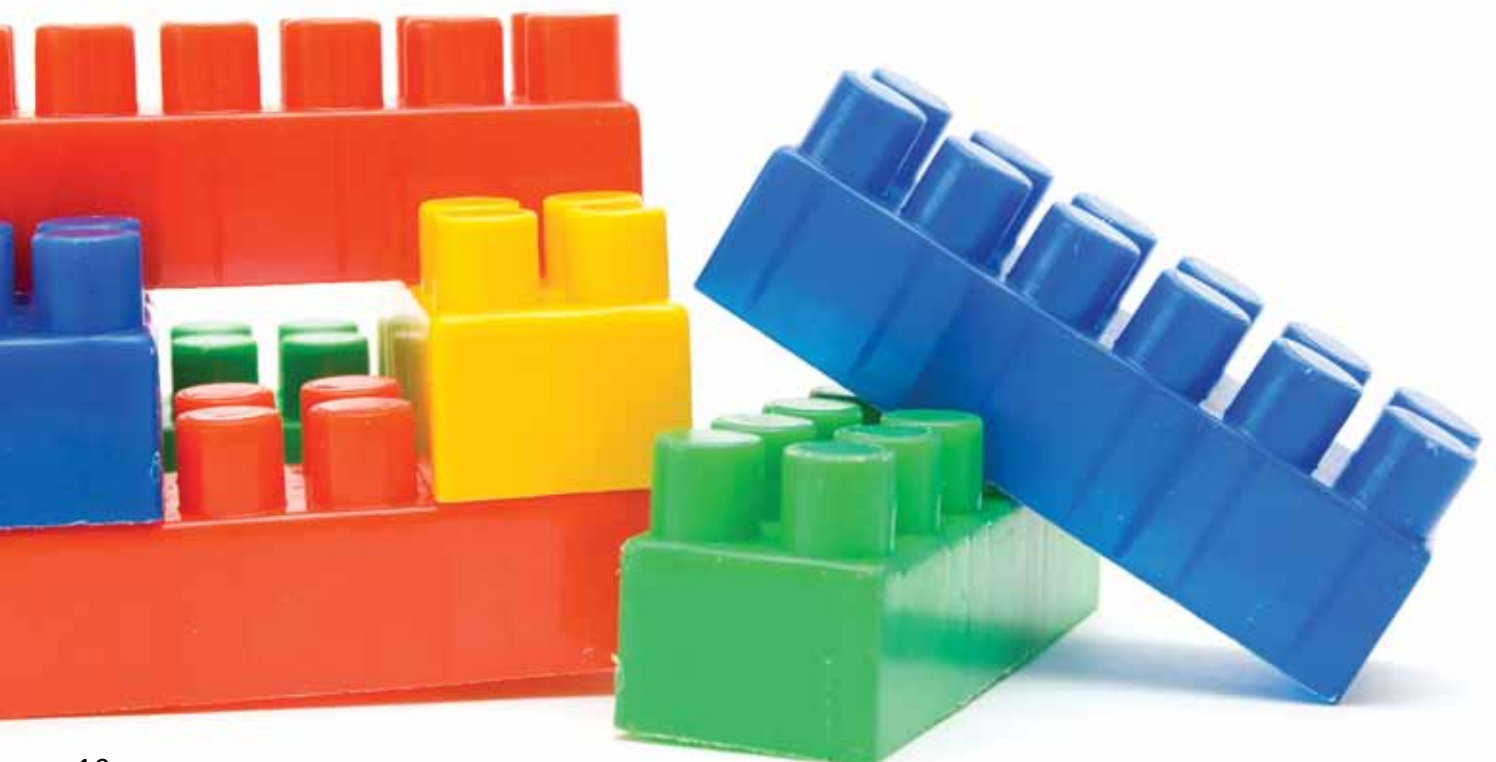
This bringing together of both education and care in the early years of children's lives, rather than leaving education in the domain of schooling, is being supported by a range of legislative innovations. On 1 January 2012 a new National Quality Framework for Early Childhood Education and School Aged Care will come into effect. The National Quality Framework will cover long day care, family day care, outside school hours care and preschools and is being implemented through two major reforms: The Early Years Learning Framework and The National Quality Standard.

The Early Years Learning Framework describes the principles, practice and outcomes to support and enhance young children's learning. It describes the five principles and eight aspects of practice for effective early childhood education and care, and identifies five learning outcomes for young children; Identity, Community, Wellbeing, Learning and Communication. This

has been discussed further in a book I co-authored, *The Early Years Learning Framework in Practice: A handbook for educators and parents* (Teaching Solutions, 2011).

In order to know that learning outcomes are being achieved, it is necessary for educators to make judgements about each child's learning through different forms of documentation and assessments, and by monitoring their progress and skill development. This is a process known as assessment for learning. I recently wrote another book, *Assessment for Learning: Documentation and Planning for the EYLF* (Teaching Solutions, 2011), aimed at introducing early childhood educators to this new requirement of the profession. Further professional development on the Early Years Learning Framework is offered by Early Childhood Australia. ACER Press nationally distributes Early Childhood Australia's *Everyday Learning and Research in Practice* resources.

The second major reform, the National Quality Standard, outlines seven areas that research has shown indicate a quality environment for young children's learning and development. Early childhood services will be measured against the National Quality Standard and the information shared on the



government's *mychild* website. The seven quality areas are:

1. Educational program and practice
2. Children's wellbeing, health and safety
3. Physical environments
4. Staffing arrangements
5. Relationships – interactions within the service
6. Collaborative partnerships with families and communities
7. Leadership and service management

The Commonwealth Department of Education, Employment and Workplace Relations (DEEWR) commissioned ACER to conduct an evaluation of the assessment and rating instrument and process that has been designed to support the National Quality Standard. ACER's evaluation focused on the application of the assessment and ratings process during trials by assessors in over 200 children's services across Australia. The findings of ACER's evaluation are being used to improve the instrument, resources and the process before it is formally introduced in 2012.

The National Quality Framework has brought about many changes impacting on the profession of early childhood education and care. People working with young children will be called early childhood 'educators' to better reflect the significance of their role in children's learning and development. Staff:child ratios will be improved to enable early childhood educators to interact with each child more frequently and for increased lengths of time. All staff working in early childhood settings will be required to have an early childhood qualification. The exact implementation date of this last requirement is not yet determined but may be as early as 2014. Initially, however, the requirement will be that all staff must be enrolled in at least a Certificate III course.

Furthermore, all four-year-old children will have access to a preschool program staffed by a four-year degree trained

staff member. ACER recently worked in partnership with Monash University to map and analyse currently available early childhood education and care tertiary courses across Australia. The study was conducted for DEEWR and focused on the avenues to becoming a four-year degree qualified early childhood educator. It will be important to ensure that there are enough tertiary places available to satisfy the demand created to meet this new legislation.

A new national body, the Australian Children's Education and Care Quality Authority, has been established to facilitate the new national approach to early childhood education and care, and to ensure that services meet the quality standards. The success of the National Quality Framework's implementation will be further monitored by studies of children's achieved development and learning outcomes, such as the Australian Early Development Index and the Longitudinal Literacy and Numeracy Study.

The Australian Early Development Index (AEDI) measures how children have developed by the time they start school, within the five main areas of early childhood development: physical health and wellbeing, social competence, emotional maturity, language and cognitive skills, and communication skills and general knowledge. ACER conducted the first national implementation of the AEDI in 2009. Subsequent implementations will enable results to be compared for the purposes of determining if progress is being made and to suggest future improvements to early childhood education and care.

ACER is currently establishing a *Longitudinal Literacy and Numeracy Study: Transitions from Preschool to School* (LLANS:TPS). This three-year longitudinal study, to be undertaken from 2012-2014, is designed to investigate growth in literacy and numeracy achievement in a sample of Australian children in preschools in the year prior to school entry, and in their first two years at school. This study

follows the ACER *Longitudinal Literacy and Numeracy Study*, which, from 1999-2005, surveyed a national cohort of students from the first year at school to Year 6. The *Longitudinal Literacy and Numeracy Study for Indigenous Students* (ILLANS), discussed earlier in this publication, was a parallel study to the LLANS.

The LLANS:TPS will investigate the nature of growth in literacy and numeracy achievement in young children, and some of the factors that influence individual growth trajectories in these two key areas of learning. In the context of the Australian government setting aside funding to ensure that by 2013 every child has access to a quality early childhood education program in the year before formal school, the LLANS:TPS project will be a timely investigation of the developmental trajectories of a cohort of children as they make their transitions from preschool to school.

The new national regulations have led to early childhood settings beginning to review their programs and practice. An enormous amount of professional learning, reflection and development has been taking place, both formally and informally. Staff in early childhood centres no longer see a single focus on 'child care' or 'meeting children's needs' as an accurate reflection of the service they are now required to offer. It is changing from an industry to a profession.

This is a challenging time for everyone working in the field of early childhood and for the families of young children. However, this is a moment for excitement and pride as the profession moves towards more appropriate recognition of the important work they do.

ACER works in partnership with Early Childhood Australia to nationally distribute their *Everyday Learning and Research in Practice* resource series. For further information visit <www.acer.edu.au/eca>. ■



Addressing educational disadvantage

ACER was commissioned by the Review of Funding for Schooling Panel to assess the way school funding is targeted to disadvantaged students.

Adrian Beavis discusses the findings of the report.



The current government review of school funding is an opportunity to ensure that every school has the resources necessary to enable all students to reach their potential. Some students require more resources than others. Many students in Australian schools are educationally disadvantaged and require extra support, and therefore extra funding.

The Commonwealth Department of Education, Employment and Workplace Relations, as part of the review of school funding, recently commissioned ACER to conduct an assessment of current processes for targeting of schools funding to disadvantaged students. The resulting report considers the questions: what are the main

areas of educational disadvantage, how do existing programs seek to address educational disadvantage, are these programs effective, and should alternative funding approaches be considered?

Areas of educational disadvantage

Educational disadvantage comes in many forms. The groups of educationally disadvantaged students identified for this study were students with disabilities, Aboriginal and Torres Strait Islander students, students with limited English language proficiency, low socioeconomic status (SES) students, and students in regional, rural and remote areas.



Adrian Beavis is the Research Director of ACER's Policy Analysis and Program Evaluation research program.

Research showed there has been steady growth in the enrolment of students with disabilities. In 2008 there were nearly 158 000 students with disabilities receiving targeted funding. Government schools accounted for about 80 per cent of these students. The number of students with disabilities enrolled in the government sector as a proportion of all students varies between states but averages between five and six per cent, compared to just under three per cent in the non-government sectors.

The number of Aboriginal and Torres Strait Islander students has also grown steadily across the school sectors nationally. During the past decade, nationwide enrolment of these students in government schools grew by about 35 000 students to reach nearly 134 000 and increased by about 7500 in non-government schools to total 22 300. Aboriginal and Torres Strait Islander students represented nearly six per cent of total enrolments in government schools compared to nearly two per cent in non-government schools.

While it was difficult to map the demand and provision of services supporting English language proficiency, the analysis found that over 176 000 students are currently enrolled in English as a Second Language (ESL) programs. Student enrolments with a Language Background Other Than English (LBOTE) range from less than 10 per cent to nearly 25 per cent across jurisdictions. Non-government schools have a greater share of LBOTE students in six out of the eight jurisdictions across Australia.

Socioeconomic status is measured in different ways by the Australian government and different states and territories. The 2006 National Census revealed that about 77 per cent of children from low income families (where family income is less than \$1000 per week) are found within government schools. Around 26 per cent of all students at government schools were from low

income households compared with 17 per cent at Catholic schools and 19 per cent at independent schools.

Students in remote and very remote areas are a small part of the Australian school population. In 2008, there were about 50 000 students in remote areas and just over 30 000 in very remote areas spread across Australia. A further 876 000 students were located in provincial areas. Around 70 per cent of students in provincial areas, more than 80 per cent of students in remote areas and 89 per cent of students in very remote areas attend government schools.

Funding for educational disadvantage

In the 2009-10 financial year national targeted government funding for disadvantaged groups totalled about \$4.4 billion. Nearly \$2.8 billion (62 per cent) of this was allocated for students with disabilities. Low SES students received about \$585 million (13 per cent) of targeted funding, Indigenous students received \$436 million (10 per cent), regional/rural/remote students \$337 million (eight per cent), and English Language students \$333 million (seven per cent). Due to the complexity of funding arrangements and differences between the states and territories, these figures are likely to underestimate total funding to educationally disadvantaged groups. There may also be considerable overlap between some of these groups, so these figures need to be treated cautiously.

Funding is currently allocated by using a variety of methods such as per school and per student formulae, grants and school-based submission models, and entitlement models where a particular type and level of service, rather than a dollar amount, is specified. For example, all states and territories allocate funding to government schools for socioeconomic disadvantage, disability and ESL, in forms such as additional staffing, added weights to a school's base budget and per-student

or grant payments. Several jurisdictions also provide funding through targeted programs for identified groups with conditions attached to the use of funds. Non-government schools receive grants from state and territory governments that are calculated using different formulae, weightings and procedures.

A significant problem for non-government schools is dealing with abrupt changes in the amount of school level targeted funding required for disadvantaged students. For example, when a student with a disability enrolls the school may need to install an elevator to accommodate a wheelchair.

The government sectors are better placed to absorb these costs because they set aside about 13 per cent of their total budget for disadvantaged students, which can be distributed across each system to reduce the impact at the individual school level.

Conclusions

The analysis revealed that very few existing programs have been evaluated for their effectiveness in reducing the impact of disadvantage on educational outcomes.

Anecdotal evidence collected as part of the study suggests that all states and territories feel that ESL programs and remote and rural programs are, on the whole, effective in delivering positive educational outcomes to students. The effectiveness of specific Indigenous and low SES programs was unclear. It also remained unclear to what extent policies designed to increase parental choice of school led to an increase in the concentration of disadvantage.

The funding of students with disabilities is an important issue for the non-government sector due to the current imbalance with government sector schools in resourcing for these students. The report points out that there are good reasons for this imbalance. Government schools, as part of a large system, have budgets that can smooth out the lumpiness that the enrolment of a student with

disabilities can cause locally. The report proposes the establishment of a standard disabilities entitlement to frame minimum funding standards across the Catholic and independent sectors in all states and territories. Such an arrangement needs to be considered in relation to equity, effectiveness and efficiency. In terms of equity, the financing should not deplete already existing funding for government schools.

For government schools, funding for students from low SES backgrounds is important because of the higher concentration of these students in the government sector, and particularly in


some schools which have lost students and staff as their condition deteriorates. (These are referred to as 'residualised' schools in the report.)

The report proposes an alternative funding mechanism for these schools where, by delivering significant investment funding above and beyond current funding for a period of up to ten years, such schools would be able to invest in areas such as quality teaching practices, materials, school leadership and facilities. A key outcome of this investment strategy would be an increase in student enrolments delivering long term savings in the unit costs of schooling.

The report concludes that there is no straightforward, 'one-size-fits-all' approach for government funding of disadvantaged students. Each group has its individual needs and the costs associated may differ significantly between them.

The full report, *Assessment of current process for targeting of schools funding to disadvantaged students: A report prepared for the Review of Funding for Schooling Panel*, by Adam Rorris, Paul Weldon, Adrian Beavis, Phillip McKenzie, Meredith Bramich and Alana Deery is available from <http://research.acer.edu.au/policy_analysis_misc/10/> ■





The science of learning

Geoff Masters explains how an emerging field of research is improving our understanding of how students learn.



*Professor Geoff Masters is
ACER's Chief Executive Officer.*

Advances in our understanding of human learning are challenging long-held assumptions about education.

For example, it was once believed that individuals differed significantly in their capacity to learn. However research in neuroscience has shown how the plasticity of the brain enables almost all individuals to learn throughout the lifespan. In schools this means that, although students are at different points in their learning and are progressing at different rates, almost

all students are capable of successful learning if motivated and if provided with appropriate learning opportunities and support.

The emerging multidisciplinary field of the science of learning integrates neuroscience, psychology, complex systems, educational research and classroom teaching practice to build a deeper understanding of learning processes. ACER is collaborating with the Queensland Brain Institute to establish Australia's first Science of Learning Centre.



Based jointly at the University of Queensland and ACER, the Centre will be a cross-disciplinary initiative to identify, research and understand effective teaching and learning practices in the light of current knowledge about basic learning processes and factors that influence successful human learning. The Centre also aims to advance research into, and knowledge about, learning itself.

The Centre will comprise researchers with backgrounds in neuroscience, psychology, education, imaging and

complex systems. Research in each of these disciplines is contributing to a better understanding of ways to support successful school learning. The Centre will employ state-of-the-art brain imaging technology and modelling techniques to synthesise findings across disciplines.

At a micro-level, research in neuroscience will explore how learning leads to changes in the structure of brain cells and in the manner in which cells interact in brain circuits. At an intermediate level, research in psychology and cognitive neuroscience will explore how learning is associated with changes in simple behaviours and motivation that are reflected in changes in neural activity in the brain. At the most global level, educational research will explore learning as the acquisition of complex knowledge and skills and resultant changes in observable behaviour.

The Science of Learning Centre's research program will explore these different aspects of learning simultaneously, involving a range of researchers, tools and techniques from across the research spectrum.

The role of emotions and beliefs in learning

In July 2011 the Science of Learning Centre held its first meeting. At that meeting, I reviewed research on the role of emotions and beliefs in learning.

Research in neuroscience and cognitive psychology has revealed that people are more likely to learn and to remember if intrinsically motivated and emotionally engaged. In classroom settings, learning is promoted by 'learning cultures' in which all students are expected to learn successfully, are highly engaged and feel safe and supported in their learning.

Conversely, negative emotions such as stress and fear of failure have been shown to impede learning and memory. In classroom settings, these emotions can be the result of 'performance cultures' in which

learning is extrinsically motivated and students compete with each other for success.

Other research has shown the importance of positive attitudes and beliefs about learning. Learners are more likely to learn successfully if they believe that they are capable of learning – in other words, if they have positive views of themselves as learners. They also must believe that effort will result in success.

Learning is maximised when tasks are targeted just beyond individuals' current levels of attainment – in the region where success is possible, but often only with scaffolding and support. In mixed-ability classrooms, students learn best when provided with learning opportunities matched to their varying interests and progress.

Progress in our understanding of learning is challenging long-held educational theories. Another example is the general acceptance in society that not everybody can excel. Not everybody can be an Olympic athlete, just as not everybody can be tall. By analogy, it is argued, not everybody can (or even should) achieve excellence in the learning of mathematics or languages or science.

However, educational achievement is not pre-determined in the way that attributes such as height are pre-determined. Just as levels of health, wealth and educational participation have increased in the general population over time, there is no reason why the percentage of students achieving excellence also should not increase.

Achievement is strongly influenced by the quality of teaching. Improved understanding of learning processes will lead to more effective teaching practices, which in turn will create better educational outcomes for young people.

Further information about the Australian Science of Learning Centre is available from <www.qbi.uq.edu.au/solc> ■

ACER launches scholarships app

ACER's Cooperative Scholarship Testing Program (CSTP) will next year conduct its 50th testing cycle.

To mark the 50th anniversary of CSTP, ACER has recently launched a new Scholarships iPad app containing sample materials and interactive practice questions.

The Scholarships iPad app contains the following features:

- Humanities, Mathematics and Written Expression Tests for each level
- Automatic marking for the Humanities and Mathematics tests
- An email feature, so that you can send the Written Expression Tests to a teacher or tutor for assessment and feedback. (Note: ACER does not provide marking or feedback for the Written Expression.)
- A complete list of participating schools and a link to their websites for online registration in the scholarship testing
- All questions are trialled materials and come from the same pool of

testing items that are used in the tests. This is the only application for the iPad for which this is the case.

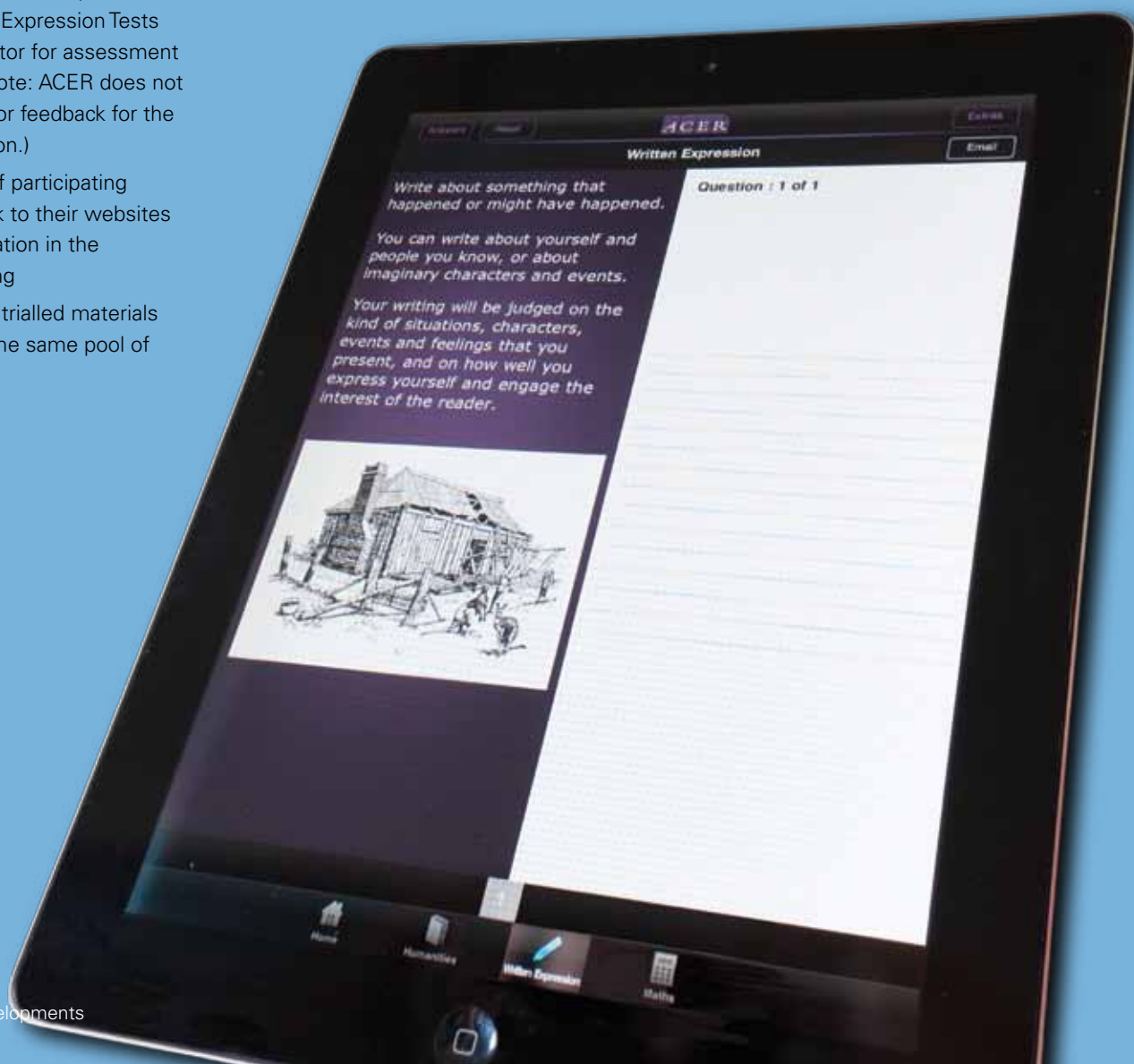
A free sample of the Scholarships iPad app is available from iTunes. Extended versions for each of the testing levels are available for purchase separately. Printed sample question booklets are also available.

Established in 1962, CSTP is an annual program of scholarship testing used by schools across Australia to select academically gifted students for the award of a scholarship. Approximately 150 independent schools currently

use the service for entry into the first, middle or final years of secondary school. The test is held on one day, and is a cooperative test, meaning that candidates can register with more than one CSTP school, but they sit the test once only.

As of 2012, the test will take place in February. Previously, the CSTP test date was in May each year. Schools wishing to participate in the February 2012 testing program must register with ACER as soon as possible.

For further information visit <www.acer.edu.au/tests/cstp> ■



ACER Occasional Essays

The ACER Occasional Essays series aims to provide thought leadership that can create a positive impact on learners and their needs, on the learning profession and on places of learning, and fosters a learning society in which every learner experiences success and has an opportunity to reach their potential.

In *The Power of Expectation*, the first in this new series of research-based, expert opinion articles, ACER CEO Professor Geoff Masters argues that setting high expectations is an important element to improving student educational outcomes.

In the second Occasional Essay, *Assessing Student Learning: Why Reform is Overdue*, Professor Masters argues that advances in our understanding of human learning require new approaches to assessing and monitoring student learning.

In the latest Occasional Essay, *The Hard Work of Improvement*, Professor Masters argues that achieving improvements in performance requires more than a focus on results and compliance with standards and minimum expectations. Rather, it requires deep engagement with the quality of practice.

The essays are available from the Media Centre on <www.acer.edu.au>

Greater principal autonomy needed for partnership growth

School principals need greater autonomy and flexibility to develop school-community partnerships so that they can generate cooperation, trust and participation, an ACER review of research suggests.

In his Policy Brief, *Schools in their Communities*, ACER Principal Research Fellow Dr Robert Simons argues that the centralised model of governance that has traditionally characterised state jurisdictions tends to limit the leadership principals can provide in facilitating effective school-community partnerships.

The Brief considers three models of partnerships in schools and communities that have been developed in Australia during the last fifteen years, identifies the key factors in their success, then proposes policy recommendations in response to the key challenges faced in the continuing development of school-community partnerships.

The full Policy Brief, *Schools in their Communities* by ACER Principal Research Fellow Dr Robert Simons, is available from <research.acer.edu.au/policy_briefs/2/>

Schools First

The recipients of the 2011 NAB Schools First Impact and Seed Funding Awards for school-community partnerships were announced in September and State/Territory awards in October. From 863 applications, 60 winning schools received \$50 000 Local Impact Awards, with another 50 receiving a \$25 000 Seed Funding Award. Impact Awards are allocated to schools whose community partnerships are already taking effect and are having a demonstrated impact on students, while Seed Funding Awards are provided to schools that are in the early stages of a partnership.

NAB Schools First is a partnership between NAB, ACER and the Foundation for Young Australians (FYA). The program began in 2009, and it has recently been confirmed that it will continue for a further three years.

All Impact Award winners are eligible to become their respective State/Territory Impact Award winner and receive an additional \$50 000 towards their school-community partnership. Each State/Territory Impact Award winner is then in the running for the National Impact Award where their total aggregate awards funding will be \$500 000. The National Award is announced in November. For more information see <www.schoolsfirst.edu.au>

Principal for a Day

Around 100 community and business leaders participated in the annual Principal for a Day program in Victorian state schools in August. Principal for a Day is a partnership between ACER and the Victorian Department of Education and Early Childhood Development (DEECD).

Principal for a Day provides a unique opportunity for business and community leaders to shadow a school principal and gain a first-hand, behind-the-scenes experience of the strengths and challenges facing state schools every day.

More information is available from <www.acer.edu.au/pfad>

Preparing students for using mathematics in the real world

Effective mathematics teachers encourage students to see the world numerically and interpret everyday information mathematically, according to a review of research released by ACER in August.

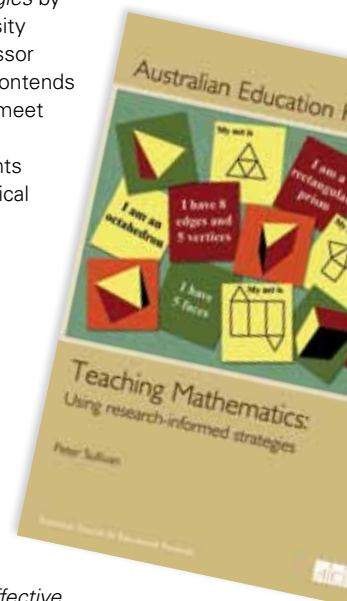
Teaching Mathematics: Using research informed strategies by Monash University academic Professor Peter Sullivan, contends that in order to meet the demands of adult life, students need mathematical knowledge that is flexible and adaptable.

The review draws on the proceedings of the 2010 ACER Research Conference, *Teaching Mathematics? Make it count: What research tells us about effective mathematics teaching and learning*, and on international research to suggest that the main emphasis in mathematics teaching and learning in the compulsory years of schooling should be on practical and useable mathematics that prepares students for work and for living in a technological society.

The Australian Education Review (AER) series is edited by ACER Senior Research Fellow Suzanne Mellor. AER number 59, *Teaching Mathematics: Using research informed strategies* by Peter Sullivan, is available as a free download from the ACER website at <www.acer.edu.au/aer>. Print copies can be purchased from ACER Press. Contact customer service on 1800 338 402 or via email on <sales@acer.edu.au>

Decrease in number of students considering dropping out of university

There has been a decrease in the number of university students who are considering leaving university before graduation, according to *Dropout DNA, and the genetics of effective support*, a research briefing from the Australasian Survey of Student Engagement (AUSSE), released by ACER in June.



The number of first-year students who seriously considered leaving university before graduation decreased from 35 to 27 per cent between 2008 and 2010. The number of later-year students increased, however, from 31 to 34 per cent between 2008 and 2010.

The report recommends that universities increase resourcing for student support, including staff contact, course advice, mentoring, transition programs, academic writing courses, internship opportunities, counselling and other student services.

The full report is available from www.acer.edu.au/research/ausse

Aptitude testing in university admissions

An ACER report released in May by the Commonwealth Department of Education, Employment and Workplace Relations called for the wider use of aptitude testing to ensure that senior secondary students with the capacity to do well at university are able to gain admission.

Report co-author, ACER Higher Education Research Director, Associate Professor Hamish Coates said there is a need to develop new approaches to university selection that are simple and transparent for prospective students, and that maintain practical benefits for institutions.

The report was based on a pilot program using uniTEST – an aptitude test that assesses reasoning and thinking across the two broad domains of mathematics and science, and humanities and social sciences. The study found that uniTEST identified students who would not otherwise have been offered a university place, and that these students performed on a par with students who entered university through other means, most commonly through Year 12 scores.

The full report is available from: www.deewr.gov.au/HigherEducation/Publications/Pages/sattapilotprogram.aspx



Indigenous students highly engaged with university study

Indigenous university students experience similar or higher levels of satisfaction and engagement with learning than their non-Indigenous peers, according to a briefing paper from the Australasian Survey of Student Engagement (AUSSE) released in May.

Yet despite such positive findings, Indigenous students are significantly more likely to seriously consider leaving their current institution prior to completing their studies.

One third of students' comments rated Indigenous centres as among the 'best aspects' of how their universities engaged them in learning, leading the authors to conclude that such centres play a vital supporting role.

The full briefing, *Dispelling myths: Indigenous students' engagement with university*, is available from ausse.acer.edu.au

Future of regional communities relies on regional higher education

Regional higher education institutions contribute significantly to the potential for Australia's regional communities to develop a sustainable future, an ACER report suggests.

The Commonwealth Department of Education, Employment and Workplace Relations (DEEWR) released the ACER report on the characteristics, motivations, experiences and outcomes of students enrolled at higher education institutions in regional areas of Australia.

The report revealed that, five years after completing their courses, 66 per cent of those who were enrolled at regional institutions and are employed are still living in regional areas. Report co-author and ACER Senior Research Fellow, Dr Sarah Richardson said the findings challenge assumptions that most regional students move to the city after graduation.

The full report, *Australian Regional Higher Education: Student characteristics and experiences*, by ACER Senior Research Fellow Dr Sarah Richardson and ACER Research Fellow Tim Friedman, is available from research.acer.edu.au/higher_education/22/

Education and training and the avoidance of financial disadvantage

ACER research released by the National Centre for Vocational Education Research (NCVER) in July investigates to what extent

different types of education and training reduce the risk of experiencing financial disadvantage.

Education and training and the avoidance of financial disadvantage by ACER Principal Research Fellow Dr Gary Marks examined the relationship between post-school qualifications and financial disadvantage among adult Australians between 2001 and 2008. The study focused on four dimensions of financial disadvantage: income poverty; financial stress; unemployment; and low wealth.

The full report is available from research.acer.edu.au/transitions_misc/9/

Dog walkers more likely to engage in independent outdoor activities

Children who walk their pet dog are also more likely to engage in general independent outdoor activities without adult supervision, according to ACER research presented at the National Society for Behavioural Nutrition and Physical Activity conference in June.

The study sought to discover whether walking a pet dog increases children's physical activity and their ability to move through their neighbourhood without adult supervision, also known as independent mobility.

The research involved an analysis of survey data and pictures drawn by more than 800 Victorian primary school children aged between 8 and 12 years. It found that 76 per cent of children who walk their pet dog report being allowed to go outside to play with friends without adult supervision, compared to only 59 per cent of children who do not own a dog.

Analysis was based on data looking at children's independent mobility and active transport collected in 2010 using VicHealth funded data. Data was collected from 1427 primary school aged children from Prep to Year 6 aged 4 to 12 years across 19 primary schools in Victoria.



2012 conference

The ACER Research Conference 2012 will take place in Sydney on the theme of *School Improvement: What does the research tell us about effective strategies?* The conference will take place from 26-28 August at the Sydney Convention Centre.



Research Conference

2012

School Improvement:

What does the research tell us
about effective strategies?

26–28 August 2012
Sydney Convention Centre
Sydney, NSW

Enquiries and registrations:

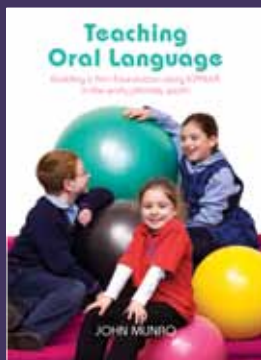
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Australian Council for Educational Research

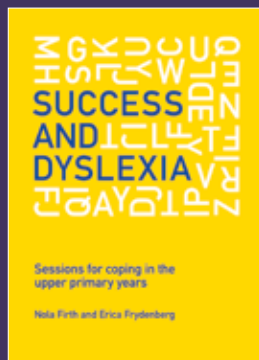


NEW TITLES FROM ACER PRESS



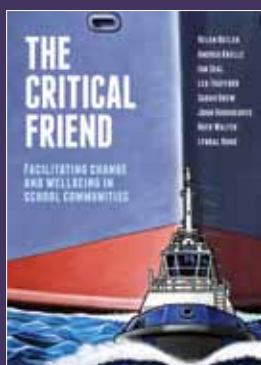
In **Teaching Oral Language**, John Munro explains the practical application of his step-by-step model, ICPALER. The Ideas–Conventions–Purposes–Ability to learn–Expression and Reception framework describes the various aspects of oral language from a classroom perspective and demonstrates how teachers can best guide students to become effective communicators and language users. Designed to facilitate teaching and assessment, and to equip teachers to hear and see students' speaking and listening skills, ICPALER promotes the use of self-talk and empowers students to become self-teachers of oral language.

John Munro | \$39.95



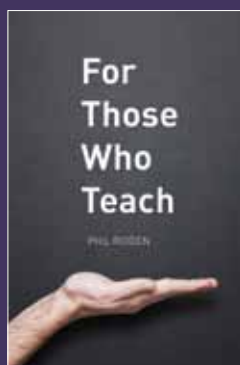
Success and Dyslexia is a unique, evidence-based program that assists all upper primary students, but especially those with dyslexia, to increase their ability to take control of and cope well with the problems that occur in their lives. Underpinned by cognitive behavioural principles and recent coping and learning disabilities research, **Success and Dyslexia** concentrates intensively on three key skill areas: awareness and strengthening of current coping methods, challenging self-defeating thoughts, and assertion skills to discover needs and ask appropriately for support. An accompanying DVD contains interviews, role-plays, useful resources and weblinks, as well as handouts for classroom use.

Nola Firth and Erica Frydenberg | \$49.95



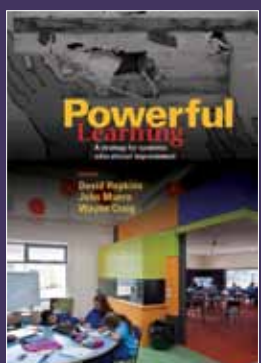
The **Critical Friend** has become an increasingly vital partner in facilitating organisational change across the spectrum of teaching and learning, health promotion and continuing professional development in today's school communities. But just what is a 'Critical Friend', why do schools need them, and what does it take to be an effective, efficient and inspirational agent in this role? Drawing on findings from three intensive, school-based research initiatives, **The Critical Friend** clearly defines this evolving and complex vocation, and demonstrates a range of frameworks and applications for current and future practice.

Helen Butler, Andrea Krelle, Ian Seal, Lea Trafford, Sarah Drew, John Hargreaves, Ruth Walter and Lyndal Bond | \$29.95



There are many things over which teachers have little control and which are difficult to change—but teachers can change how they view the challenges they face, and how they deal with them. **For Those Who Teach** draws on the author's wealth of experience and on his passion for teaching. From context to curriculum, from collaboration to community, from understanding teaching as a calling to the days when we struggle to cope, **For Those Who Teach** will inspire teachers to regain their balance, their focus, their motivation, and their determination to make a difference in students' lives.

Phil Ridden | \$24.95



Premised upon an intensive program in the Northern Metropolitan Region of Melbourne, **Powerful Learning** delivers an evidence-based, results driven approach to large-scale educational reform in schools. Pre-eminent educationalists David Hopkins, Wayne Craig and John Munro, together with a team of highly credentialed contributors, explicate a 'grand theory' of system change that leads to measurable outcomes in enhanced student learning and accelerated achievement over time, with the central tenet that every student will reach their potential.

David Hopkins, Wayne Craig and John Munro | \$29.95



Two Way Teaching and Learning addresses the interface where two cultures meet—in the classroom, the school and the community. Most of the contributors to this book are Indigenous, and all are highly experienced practitioners drawn from academia, the teaching profession or the community. Together they put the spotlight on policies and processes that facilitate informed, respectful relationships in education, as well as those that reinforce cultural inequity and inequality.

Nola Purdie, Gina Milgate and Hannah Rachel Bell | \$49.95

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